

## New genus and species of Chrysopetalidae (Polychaeta) from hydrothermal vents (south-western Pacific)

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### ABSTRACT

*Thrausmatos dieteri* new genus, new species, is described from hydrothermal vents from the North Fiji Back Arc Basin and from a cold seep, Lihir Island Fore Arc Basin, New Ireland, Papua New Guinea. *Thrausmatos* n. gen. is characterised by a small quadrate prostomium, anteriorly inserted median antenna, palps that are distally retractile, a single, paleate, ornate, notosetal fan with median fascicle absent and long, slender dorsal cirri. Neuropodia on all specimens possess long, falcigerous neurosetae with minute bifid tips and also a small distinct fascicle of highly serrate spinigers, that are probably epitokous in function, and prominent ventral glandular pads.

KEYWORDS: Polychaeta, Chrysopetalidae, new genus and species, *Thrausmatos dieteri*, hydrothermal vents, North Fiji Back Arc Basin, cold seep, Lihir Island Fore Arc Basin, Papua New Guinea.

### INTRODUCTION

Eighteen polychaete families have been reported from hydrothermal vents from the eastern and western Pacific (Tunnicliffe *et al.* 1998). Three of these families, Alvinellidae, Polynoidae and Ampharetidae, have been listed from south-western Pacific sites in the Lau and North Fiji Basins (Desbruyères *et al.* 1994).

The new genus and species described herein is the first record of the family Chrysopetalidae collected from hydrothermal vents and cold seeps. Of the eleven genera so far described for the Chrysopetalidae (Watson Russell 2000b), four have been reported from deep-sea oxic-anoxic interfaces. Two of these genera possess paleate notosetae - *Arichlidon reyssi* Watson Russell, 1998, from soupy muds at 3,947 m in the eastern Mediterranean and *Strepternos didymopyton* Watson Russell, 1991, from 'wild' wood debris and experimental wooden panels at 3,995 m in the western Atlantic. The other two genera possess spinose notosetae - *Dysponetus* cf. *gracilis* at 3,000 m from xenophyophores (giant sediment-agglutinating protozoans) and the caldera floor of sea-mounts of the eastern Pacific (material kindly lent by Lisa Levin and examined by author), and an unnamed taxon close to *Vigtorniella* Kisseleva, 1992, found infesting a whale skeleton in deep waters off southern California (Leslie Harris, pers. comm.).

*Thrausmatos dieteri* n. gen., n.sp., a paleate species, was retrieved from a hydrothermal vent area off North Fiji in depths to 2,002 m. The same species was also found in depths of 1,577 m at a cold seep site, south of

Lihir, Papua New Guinea. Both habitats were dominated by a speciose molluscan fauna.

The new chrysopetalid material, collected between 1995-98, was sampled by a two-shovelled, video-equipped grab covering an area of 2 m<sup>2</sup> with a penetration depth of 0.7 m into the sediment, controlled from onboard the R/V *Sonne*. Expeditions SONNE 133 and 134 were funded by the German Federal Ministry of Research while SONNE 99 was a French-German co-operation.

Specimens from all sites are in a fragmented state. The holotype is described from a long anterior end and the posterior end from paratypes. Setal terminology follows that of Watson Russell (1991).

Material examined is in the following institutions: Senckenburg Museum, Frankfurt (SMF); Northern Territory Museum (NTM).

### SYSTEMATICS

#### Family Chrysopetalidae Ehlers, 1864 Genus *Thrausmatos* gen. nov.

**Type species.** *Thrausmatos dieteri* sp. nov. Type by original designation.

**Diagnosis.** Relatively long, rectangular body form with tapered anterior and posterior ends; mid-body segments easily fragment. Notopodia along body with symmetrical, broad, paleate notosetae in a single fan and long, slender dorsal cirri. Prostomium quadrate, small, with or without eye pigment; median antenna

inserts on anterior edge of prostomium. Palps ovoid with retractile, subulate tips; oval caruncle present. First two segments with four pairs of tentacular cirri; paleal notosetae first present on segment 2. Notosetae of mid-body segments comprise lateral and main paleal fascicles; discrete median fascicle absent. Single main fan with lateral, middle and medial group paleae. Compound neurosetae of neuropodia with long, slender, minutely serrate, falcigerous blades with minute bifid tips; additional neurosetal fascicle present, comprising short shafts and highly serrate spinigerous blades. Prominent glandular pads present along body on ventrum at base of neuropodia.

**Remarks.** Characters important at the generic level in chrysopetalids include numbers of pairs of tentacular cirri and presence/absence of aciculae and setae of the anterior two or three segments; shape, size and details of the prostomium, its appendages and nuchal organ; insertion pattern of the notosetal fascicle and main paleae shape, ornamentation and numbers of internal and external longitudinal ribs, and structure of the pygidium.

The author has observed that all species within a paleate chrysopetalid genus exhibit consistency in the structure of the anterior segments and notosetal type. Those species with predominantly notosetal spines belong at the moment to the single genus *Dysponetus*, currently under review by Thomas Dahlgren. Four patterns are currently described for the structure of the anterior segments and a range of notosetal types within the eight nominal species of *Dysponetus*, indicating the genus is polymorphic.

*Thrausmatos* n. gen. is compared with the genus *Strepternos* on the basis of similar notosetal types, but the pattern of tentacular cirri of the anterior end is different (Table 1). *Thrausmatos* n. gen. is also compared with *Chrysopetalum*, *Acanthopale* and the species *Dysponetus caecus* (based on *Chrysopetalum caecum* (= *Dysponetus*)) described and figured in detail by Laubier (1968) and Dahlgren and Pleijel (1998) (Table 1). They are selected primarily for the similarity of two pairs of tentacular cirri on segment 1, and two pairs of tentacular cirri plus notosetae present on segment 2. *Acanthopale* additionally has neurosetae on segment 2. *Thrausmatos* n. gen. also shares with *Chrysopetalum* and *Acanthopale* the presence of a non-retractile caruncle.

Red pigmented granulations at the bases of antennal, tentacular and setigerous cirri, as well as mid-caruncle, are seen in *Thrausmatos* n. gen., and also occur in some species of *Chrysopetalum* (pers. obs.). The notosetal insertion patterns and main setal types of all four genera are, however, distinctly different (Table 1).

Additional remarks are presented after the species description.

**Etymology.** The generic name, *Thrausmatos*, is from the Greek, meaning easily broken, fragmented piece. Gender neuter.

*Thrausmatos dieteri* sp. nov.

(Figs 1-5)

**Type material.** HOLOTYPE - SMF 10390, south-western Pacific, North Fiji Basin, 16° 59.486' S, 173°54.910' E, Station 99 GTVA, coll. RV *Sonne* Cruise So-134 (Hyflux II), vent, Mussel Hill Area A, 1,999 m, 3 September 1998, holotype anterior end 68 segments, width of anterior segments 0.7 mm, mid-body widest point 2.8 mm, length 10 mm. PARATYPES - SMF 10391, same locality as holotype, many fragments including 9 anterior and 2 posterior ends; NTMW017243, 2 anterior ends plus fragments.

**Additional material.** SMF 10392, south-western Pacific, North Fiji Back Arc Basin, 16° 59.44' S, 173° 54.82' E, Station 93 GTV, vent, LHOS area, 1,984 m, coll. Cruise So-99 (Hyflux I), 23 January 1995, 2 fragments in poor condition; SMF 10393, 16° 59.426' S, 173° 54.819' E, Station 35 GTVA, vent, LHOS, Area A, 2,002 m, coll. Cruise So-134 (Hyflux II), 20 August 1998, many fragments including 13 anterior and 2 posterior ends; SMF 10394, 16° 59.447' S, 173° 54.937' E, Station 66 GTVA, vent, LHOS Area A, 1,997 m, Cruise So-134 (Hyflux II), 25 August 1998, 2 fragments; SMF 10395, Papua New Guinea, New Ireland, south of Lihir Island, Fore Arc Basin, 3° 19.352' S, 152° 35.462' E, Station 44 GTVA, cold seep, Mussel Cliff, 1,577 m, Cruise So-133 (Edison II), 26 July 1998, 2 fragments in poor condition.

**Description.** Based on holotype. Anterior mid-body fragment rectangular, long, tapered anteriorly, broadest at mid body; segments easily fragment. Segments number 68. Pale gold coloured paleae fans, sometimes flecked with brown scale, in transverse row in notopodium imbricating over dorsum. Neuropodia extending out beyond notopodia with long neurosetal fascicles (Fig. 1A). Brown, globular occlusions present in body.

Prostomium small, quadrate, compressed between anterior segments. Eyes not visible. Ovoid caruncle with red pigment spots posterior to prostomium.

Subulate median antenna same shape as lateral antennae, with very short ceratophore (only visible on high magnification), inserting medially on anterior edge of prostomium just dorsally to two similar sized lateral antennae, inserting on antero-ventral margin of prostomium. Prostomial cirri with filiform tips. Two ovoid palps inserting on ventral edge of prostomium both with subulate, filiform tips everted.

Segments 1 and 2 reduced, fused in part to prostomium, with four pairs tentacular cirri, same shape and length as dorsal cirri of third segment, anteriorly directed. First segment achaetous, second segment with

Table 1. Comparison of characters between *Thrausmatos* and other chrysopetalid taxa. <sup>1</sup> Refer to text for discussion. <sup>2</sup> Paleae defined as having internal longitudinal ribs.

Characters	<i>Thrausmatos</i>	<i>Chrysopetalum</i>	<i>Acanthopale</i>	<i>Dysonetus caecus</i>	<i>Strepternos</i>
Segment 2	2 pairs tentacular cirri, notosetae	2 pairs tentacular cirri, notosetae	2 pairs tentacular cirri, notosetae, neurosetae	2 pairs tentacular cirri, notosetae	1 pair dorsal cirri, notosetae, neurosetae; ventral cirri absent
Anterior segments retractile/non retractile in conjunction with nuchal organ	Non-retractile	Non-retractile	Non-retractile	Non-retractile	Retractile
Shape of prostomium	Quadrata, small	Spherical, medium size	Spherical, medium size	Quadrata, small	Oval, very small
Shape & position of median antenna on prostomium	Subulate, relatively long; anterior edge	Ovoid to fusiform, short; between anterior pair of eyes; anterodorsal	Subulate, medium size; just anterior to anterior pair of eyes; anterior edge	Fusiform, short; anterodorsal edge	Ovate, medium size; mid-dorsal
Palp shape; distinct palpophore, present or absent <sup>1</sup>	Ovoid base with distal, filiform process; absent	Cylindrical, elongate; absent	Cylindrical, very elongate; present (San Martin 1986)	Slender, very elongate; present (Dahlgren and Pleijel 1995)	Ovoid, elongate; absent
Distal part of palps retractile	Distal, filiform process retractile in part	Postulated by Racovitza (1896)	Present ?	Absent	Absent
Nuchal organ type	Discrete, ovoid caruncle; non retractile	Discrete, ovoid caruncle; non retractile	Discrete, ovoid caruncle; non retractile	Ciliary tufts	Semicircular lobe; retractile
Pygidial structure	Medial projection; anal cirri?	Quadratae pygidium; 2 anal cirri	Medial projection; 2 anal cirri	Medial projection	Medial projection
Notosetal types; adult, mid-body <sup>2</sup>	All paleae	Predominantly paleae; some spines	Predominantly paleae	All spines	All paleae
Insertion pattern of main notosetal fan	Paleae layered in single row in single fan	Clusters of paleae layered in single row; originating from multiple insertion points	Paleae originate from discrete anterior & posterior rows	Spines inserting in radiating tufts	Paleae layered in single row in double fan
Main group notosetal shape; numbers of internal and external longitudinal ribs	Long, symmetrical with broad tips; 10-20 internal ribs, 1-12 external raised ribs	Slender, blade-like, asymmetrical and symmetrical; 3-12 internal ribs; external granules; external ribs absent	Slender, curved, 'rose-bush' like with 2 rows of triangular spines; 3-5 internal ribs; external ribs absent	Long, slender with 2 rows of short spines; internal & external ribs absent	Long, symmetrical with broad tips; 11-21 internal ribs, 2-3 external raised ribs
Median notosetal fasciote, present or absent	Absent	Present; short, blade-like paleae with 1 external rib (external rib absent in 1 species)	Absent	Absent	Absent
Compound falciigerous neurosetal types; adult, mid-body	Long to medium length falciigerous blades, minutely serrated with bifid tips	Medium to short length falciigerous blades, serrate with slender, unidentate tips	Medium length falciigerous blades, serrate, bifid tips	Long to medium length falciigerous blades, finely serrate, uni-bidentate	Medium to short length falciigerous blades, serrate, with thick unidentate tips

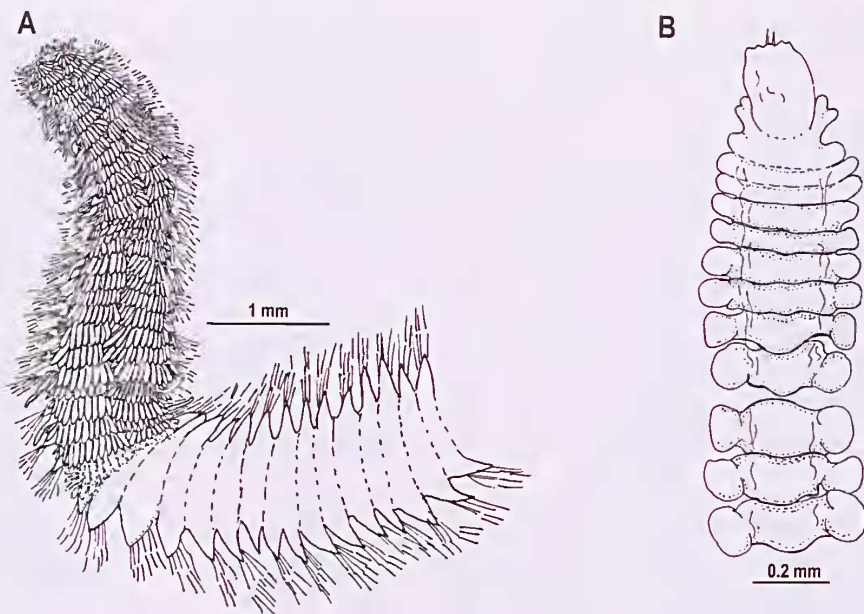


Fig. 1. A, *Thrausmatos dieteri*, n. gen. n. sp., holotype SMF 10390, anterior end of 68 segments, dorsal view; B, paratype SMF 10391, anterior end figured in part with everted proboscis and stylet tips, ventral view.

several small paleal notosetae only. Third segment biramous, partly fused to segments 1 and 2, dorsally abutting caruncle; dorsal cirri, paleal notosetae, ventral cirri and falcigerous neurosetae present. Fourth and subsequent segments as third.

Mid-body notopodia with lateral and main paleal fascicles. Single main fan with lateral, middle and medial group paleae (Fig. 2A); dorsal cirri very long and slender, extending out beyond paleal fan. Neuropodia with subacicular fascicle of heterogomph falcigerous neurosetae of graded lengths, originating below robust neuroaciculae; ventral cirri slender, extending just past tip of neuropodia. Distinct small fascicle of spinigers present superior to overlying, ventral acicula and falcigerous fascicle; present from setiger 2 (segment 4). Glandular ventral pads present.

*Additional information from paratype and other material.* Paleal and neurosetal counts are based on segments 2 and 22 of an anterior mid-body fragment and posterior-most segments of a posterior fragment from the paratypes (SMF 10391).

Segment 2 (setiger 1) with 2-3 short paleae with 12 or 13 ribs and 3 or 4 faintly raised ribs (Fig. 2F). Mid-body setigers with notosetae comprising 4 or 5 slender, serrate-margined lateral paleae with 2-6 ribs; raised ribs absent (Fig. 2B). Main paleae number up to 30; including 2-3 subunit 1 shorter palea, originating immediately above dorsal acicula, with 10 or 11 ribs and 2 weakly raised ribs (Fig. 2B). Main paleae with

13-17 ribs including up to 12 raised ribs of which one major rib and 2 or 3 others extend full length of palea (Fig. 2C). Most medial main palcae, numbering 2-4, slightly broader and asymmetrical with 19 or 20 ribs and 3-4 weakly raised ribs (Fig. 2E). Slightly misshapen, shorter palca with 13 or 14 ribs including 2 or 3 weakly raised, sometimes present within the fan in mid-lateral position (Fig. 2D). Palcae of posterior-most notopodia same shape, more slender, pointed, than those of mid-body. Lateral paleae with serrated margins, 0-1 internal longitudinal rib; largest main palcae with up to 9 ribs with 0 or 1 raised rib. All main paleae symmetrical with small elevated apices and clearly serrate margins especially on anterior  $\frac{2}{3}$  of palea.

Mid-body neuropodia with superior group of 7 falcigers with long, slim shafts and very long blades; below these a group of 12-16 falcigers with long blades (Figs 3D-E). Mid group composed of about 20 falcigers with medium sized blades graduating in length to inferior group of 8-10 falcigers with shorter-length blades (Figs 3F-I). Small, short bladed spiniger present within posterior 10 neuropodia in mid-posterior position within falcigerous fascicle.

Distal tips of all neurosetae minutely bifid; blades appear smooth and unserrated on low power; on high power very fine denticulation visible along length of blade (Fig. 3C). Neuropodia from segment 4 with small, discrete fascicle of spinigers numbering 8-12; overlying ventral acicula superior to falcigerous fascicle.

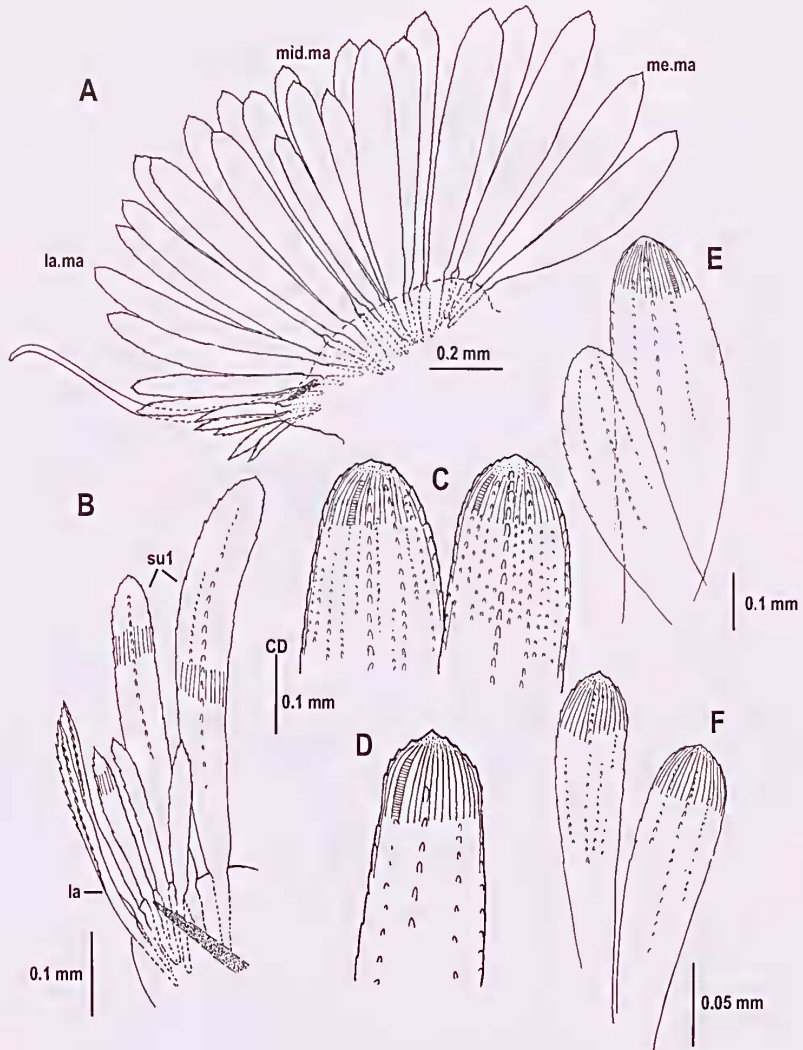


Fig. 2. *Thrausmatos dieteri*, A-F, paratype SMF 10391: A, notopodial fan of segment 22, middle body, anterior view; B, lateral paleae (la), subunit 1 paleae (su1); C, detail of two middle main paleae; D, detail of slightly misshapen main palea (see in lateral mid position of fan, 2A); E, detail of two medial-most main paleae. F, detail of two smaller paleae from segment 2. Abbreviations: la = lateral paleae, la. ma = lateral main paleae, mid. ma = middle main paleae, me. ma = medial main paleae.

Heterogomph spinigers composed of short shafts with short to medium length, basally serrate blades attenuating to fine whip-like tips (Fig. 3A,B,J).

**Remarks and discussion.** *Fragmentation.* Material of *Thrausmatos dieteri* examined from all sites was composed of fragmented anterior, mid and posterior sections of adults. A vial with the largest anterior end comprised more than 90 segments (SMF 10393). Fragmentation could be due in part to collecting and screening methods. However, the absence of any entire individuals plus the paucity of posterior ends is probably

due to the inherent ability of the worm to fragment easily. Examination of the ventra shows the first 5-10 segments to be narrower, with the division between these segments in a straight line, whereas the following segments are broader and medially curved. These segments break apart when handled with forceps and their shape and the way they fit together like jig-saw pieces suggests fragmentation under duress may be a behavioural strategy of the worm *in situ* (Fig.1B). This state is also seen in other chrysopetalid genera, especially some species of *Paleanotus* and *Treptopale* (pers. obs.).

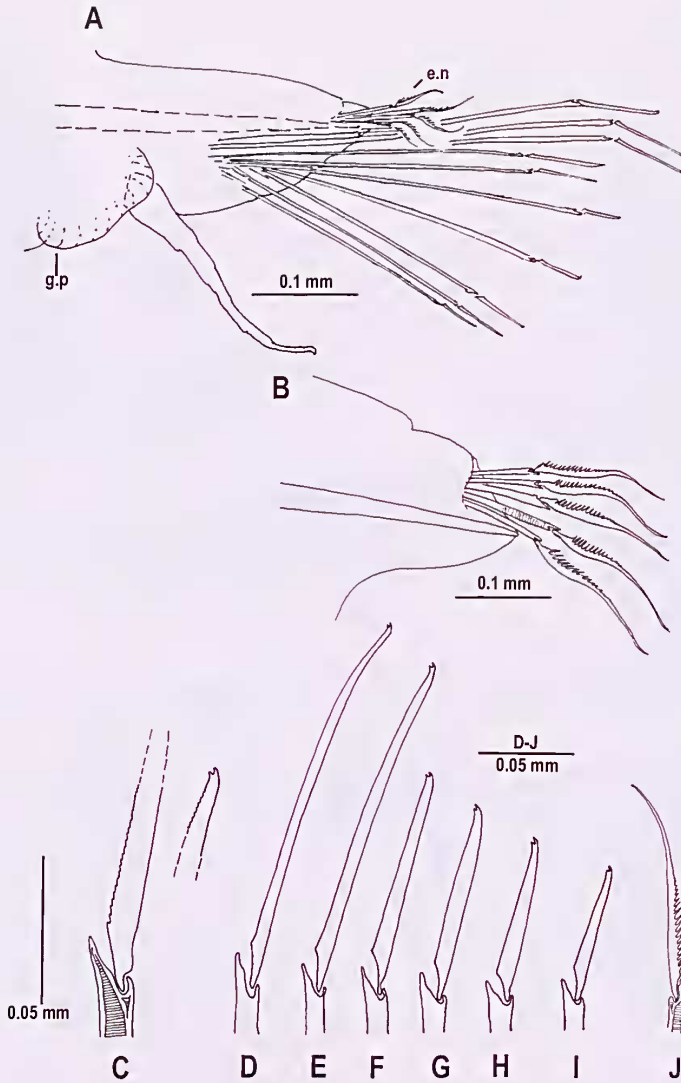


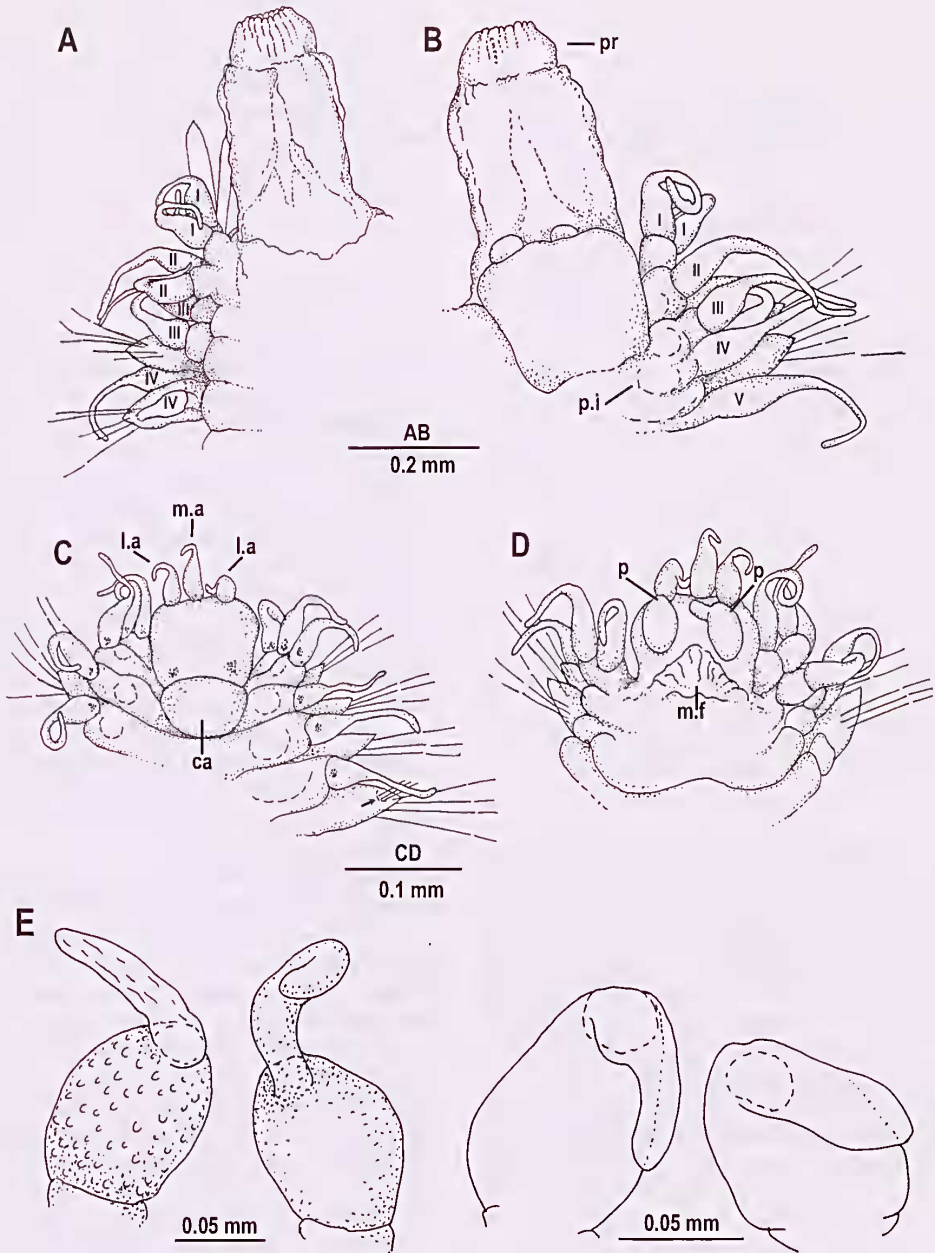
Fig. 3. *Thrausmatos dieteri*, paratype SMF 10391: A, neuropodium of segment 22, posterior view; B, detail of spinigerous fascicle; C, detail of fine denticulation on proximal and distal parts of falcigerous blade; D,E, superior neurosetal falcigers; F-I, mid and inferior position neurosetal falcigers; J, superior-most position epitokous ? neurosetal spiniger. Abbreviations: e.n. = epitokous neurosetae, g.p. = glandular pad.

**Tentacular cirri.** *Thrausmatos dieteri* has segments 1 and 2 with two pairs of tentacular cirri on each segment. The tentacular cirri are the same shape and length as dorsal cirri of the third segment. The first segment is acaetous, the second segment has several small palcal notosetae only (Fig. 4A-D).

Segments 1 and 2 of all chrysopetalids are to a greater or lesser degree fused, directed anteriorly and lateral to the prostomium and nuchal organ (which when present may be retractile). These characters are also described for *Vigtorniella* Kisseleva, 1992, the only chrysopetalid genus not examined by the author.

Pleijel and Dahlgren (1998) regarded the anterior segment cirri as tentacular cirri if they were enlarged or prolonged compared to the dorsal and ventral cirri of the following segments. Based on this criterion, Pleijel and Dahlgren (1998) discounted the occurrence of dorsal tentacular cirri but considered ventral cirri as tentacular, in the two chrysopetalid genera and species they examined.

The author has observed that both dorsal and ventral cirri of the anterior two segments (and in some cases segment 3) to be distinctly longer, a little longer and the same size compared to the cirri of following



**Fig. 4.** Various specimens of *Thrausmatos dieteri* from lot SMF 10393: A, B, specimen 1, anterior end with proboscis extended, right side figured only. A, ventral view; B, dorsal view; C, D, specimen 2, C, dorsal view; D, ventral view, anterior end of 11 segments; E, details of two sets of palps (specimens 3 and 4). Abbreviations: I = segment 1 with 2 pairs of tentacular cirri only; II = segment 2 with 2 pairs of tentacular cirri and notopaleal fascicles III = segment 3, notopodia with dorsal cirri, notopaleal fascicles and neuropodia with neurosetae, ventral cirri; IV = segment 4 and subsequent segments same as segment 3; ca = caruncle; l.a. = lateral antennae; m.a. = median antenna; m.f. = mouth fold; p = palps; p.i. = paleae insertion; pr = proboscis.

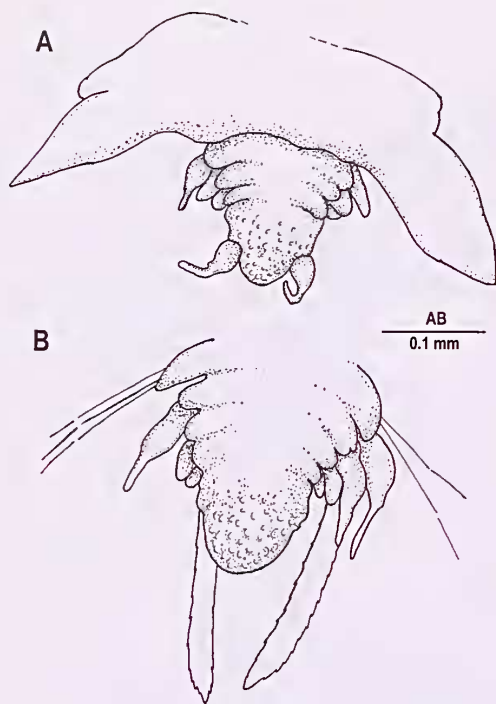


Fig. 5. *Thrausmatos dieteri*: A, paratype SMF 10391, regenerated posterior end with pygidium with 2 anal cirri; B, SMF 10393, pygidium with anal cone, anal cirri absent.

segments, across a large number of chrysopetalid genera and species. Regardless of the presence of a caruncle or nuchal fold, the first segmental line discernible on the dorsum in the majority of chrysopetalids is between that of segments 3 and 4, posterior to the mouth opening. For the purpose of simplicity I refer to cirri on the anterior two fused segments as 'tentacular cirri'.

**Eyes.** The aggregation of red pigment spots on the prostomium that are referred to as 'eyes' in *Thrausmatos dieteri* are sometimes visible (Fig. 4C) and sometimes not (Fig. 4B). Very similar eye spots are present in the post-larvae and juveniles and absent in the adults of the deep-sea genus *Strepternos* (Watson Russell 1997). Whether these pigment spots in *Thrausmatos* and *Strepternos* are true eyes and whether their lack is due to preservation techniques or the eyes are atrophied, is unclear and warrants further investigation.

**Palps.** *Thrausmatos dieteri* possesses palps composed of an ovoid base with large circular cells and a distal filiform subulate process with filiform, longitudinal cells. It appears that this latter structure may be at least partly retractile within the broad ovoid base (Fig. 4E). Proximally to the ovoid base is sometimes seen a very small fold but not a structure that could be termed a palpophore (Fig. 4E).

Palps with a palpophore have been described for *Dysponetus caecus* (Laubier 1968: fig. 1A; Dahlgren 1995: fig. 3A) and *Acanthopale perkinsi* (San Martin 1986: fig. 2). The palpostyle in these examples are not retractile within the palpophore.

In his detailed anatomical study of *Chrysopetalum debile*, Racovitza (1896) describes a shallow depression at the distal ends of the palps and suggests these tips are retractile – 'L'extrémité en est très retractile, ...' (p. 211) and 'Cette région est probablement invaginable...' (p. 213).

The author has examined many individuals of *Chrysopetalum* species and *Acanthopale perkinsi*, and has observed the palps in all these species to have a slight distal depression with slight contraction in this area, but with no additional retractile process visible. The palps are situated on bases that do not appear to be discrete palpophores but are rather homologous with the basal sections of the segments, seen in ventral view, that are posterior to, and support, the distinct tentaculophores and cirrophores of the tentacular and dorsal and ventral cirri respectively.

Dahlgren and Pleijel (1998) code the palps as 'biarticulated' for *Chrysopetalum* and *Dysponetus*, based on the presence of palpophores and palpostyles, and infer similarity to those seen in nereid and some hesionid taxa. Perhaps it is more appropriate to describe the smaller distal process that nests within the larger base as palpostyles in accordance with the terminology of these authors. This is of interest following on Dahlgren's (2000) molecular study suggesting nereids are the sister group to the chrysopetalids.

**Mouth flap and proboscis.** A triangular mouth flap is present ventral and posterior to the palps in *Thrausmatos dieteri*. The proboscis is eversible with terminal papillae and two stylets (Figs 1B, 4A-B). The stylets were difficult to dissect out entirely, owing to their small size, but were determined in one individual to consist of two slender, grooved structures partly visible through the everted pharynx wall and in another, the pointed tips were visible at the end of the proboscis. The stylet shape is typical of that seen in the majority of chrysopetalid genera. The character of a proboscis with a ring of terminal papillae is also seen in the chrysopetalids *Strepternos* and *Dysponetus caecus* (redescribed by Dahlgren and Pleijel 1995).

**Notosetal patterns.** *Thrausmatos dieteri* possesses a notosetal fascicle of only paleae, the main group inserting in a single continuous row (Fig. 2A). The long, symmetrical main palcae with ornamented ribs of *Thrausmatos*, are most like those seen in the main paleae of the deep-sea monotypic genus *Strepternos*, inserting in a single row but in two distinct fans. Main paleae of both genera possess a similar number of internal ribs and a discrete median paleae fascicle is absent.

Also of interest is a slightly misshapen main palea present in the main fan in a mid-lateral position,



occurring in *Thrausmatos* (Fig. 2D this paper) and also seen in *Strepternos* (Watson Russell 1991: fig. 3H). It appears there may be a similarity of developmental timing of the appearance and subsequent movement with maturity of this palea within the fan in both genera (Watson Russell 1997). Other morphological features of *Strepternos*, such as the tentacular cirri arrangement of segment 2, prostomial and nuchal organ features, and neurosetal types, are very different to those of *Thrausmatos* (Table 1).

**Posterior end.** Only four entire posterior ends of *Thrausmatos dieteri* were found in the samples. One posterior end, clearly regenerated, has a rounded to quadrat pygidium with two short anal cirri; two other pygidia possess a medial, glandular cone with no anal cirri present (Fig. 5A-B). The fourth pygidium has a quadrate structure dorsally with one longish cirrus present laterally, the other presumably broken, and a ventral glandular cone. More posterior ends are needed to clarify the pygidial structure.

Ventral rami are very long and pointed in posterior-body setigers. Glandular pads are prominent on the ventrum at the base of the neuropodia. In this part of the body these pads have an opening or a section of hyaline integument covering an opening. In the anterior mid-body the ventral pads are also evident but with no discernible opening. Less prominent glandular pads are seen in the same position in *Chrysopetalum* and *Paleanotus*. Their function is unknown. The integument of *Thrausmatos dieteri* is thicker and less transparent than that observed in other chrysopetalids. There are no recognizable structures, including eggs, which are usually clearly seen within mounted parapodia. However, small, golden rod-like structures with swollen tips were present.

**Specialised spinigerous neurosetae.** These are seen in all *Thrausmatos dieteri* specimens examined from all localities. Such setae were present on all anterior ends from segment 4 onwards and were present on posterior ends to within the last 10 segments. A posterior end of 25 segments, for example, had specialised neurosetae numbering 8-12 on each neuropodia of 18 segments, then were absent on the posterior most 7 segments (SMF 10391).

The position and structure of this specialised neurosetal fascicle is similar to that seen in two other chrysopetalid genera, *Arichlidon* and *Dysponetus*.

In *Arichlidon*, fascicles of long, attenuated spinigers are present between the 10<sup>th</sup> anterior and 5<sup>th</sup> posterior segments within an individual and number 3-14 per notopodium. These setae, however, were mainly present in ovigerous benthic and planktonic specimens and were interpreted as epitokous swimming setae (Watson Russell 2000a). *Dysponetus gracilis* has not been studied in detail but similar very long bladed spinigerous setae have been figured for

the species (Aguirrezabalaga *et al.* 1999). Such setae, numbering between 6-8, and present between setigers 9-22 in a 24 segmented entire individual of *Dysponetus cf. gracilis* from deep water, Bass Strait, Australia, have also been observed by the author.

The specialised setae in *Thrausmatos dieteri* are also spinigerous but are highly serrate and much shorter in length compared with those of the former genera and are also present in all individuals examined. It was not possible in this study to determine whether these setae are linked to gametogenic states but it is quite probable they are epitokous in function.

In conclusion, *Thrausmatos dieteri* is distinguished from all other chrysopetalid genera and species by its particular combination of the characters discussed above, plus the unique possession of palps with retractile filiform tips (Fig. 4D,E). The possession of a distinct neurosetal fascicle of highly serrate spinigers and the presence of prominent glandular ventral pads (Fig. 3A-I), while most probably linked to gametogenic change, appear at the present time to be unique to this genus.

**Habitat and distribution.** The following account of the hydrothermal vent and cold seep environments is from Jan Stecher (pers. comm.) and Schmidt *et al.* (in press). The sea floor bottom of the Back Arc Basin of the North Fiji sites consists of basalt with massive sulphides covered by some sediment and showed fissures, small cracks and hydrogen sulphide anomalies but with no smokers evident. The fauna is dominated by the bivalve mollusc *Bathymodiolus brevior* and the gastropod *Ifrenaria nantelei*.

The sea floor of the Fore Arc Basin south of Lihir Island, New Ireland, consists of hydrocarbon enriched sediments, mainly indurated mud, with no fissures or cracks but showing a strong seep character. Mussel Cliff is dominated by at least three species of *Bathymodiolus* with an associated fauna of vestimentiferan tube worms, brittle stars and sea cucumbers. *Thrausmatos dieteri* was retrieved from amongst the bottom fauna from both sites in depths ranging from 1,577-2,002 m.

**Etymology.** The specific name *dieteri* is named after Dieter Fiege who has a good eye for chrysopetalids and has been generous in sending me deep-sea material in the past. Gender masculine.

#### ACKNOWLEDGMENTS

I am grateful to Dieter Fiege who kindly lent this interesting deep-sea chrysopetalid material for study, and to him and Jans Stecher (SMF) for providing additional information. I would also like to thank anonymous reviewers for critically reading the manuscript, Belinda Alvarez de Glasby for arranging the figures and the Northern Territory Museum for ongoing support during the duration of this project.

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Accepted 23 November 2001